

## **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

## **LISTING OF CLAIMS:**

Claims 1 to 6. (Canceled).

7. (Currently Amended) A process for fabricating active and passive polymer-based components for use in integrated optics according to a principle based on one of a gas-phase diffusion and a liquid-phase diffusion, comprising the steps of:

depositing onto an optoelectronic component at least one patternable polymer resist layer that is highly sensitive and that effects an intense polymerization when exposed;

producing an etching mask by exposing defined regions of the at least one patternable polymer resist layer corresponding to a later component;

transferring a geometry of the etching mask through a high-grade anisotropic deep etching into unprotected regions of the at least one patternable polymer resist layer located underneath the etching mask, wherein an etching agent is used that avoids attacking a silicon oxide of the etching mask, such that exposed regions of the at least one patternable polymer resist layer are ablated in a vertical direction, and side surfaces of regions protected by the etching mask are uncovered; and

filling unexposed regions of the at least one patternable resist layer with organometallic compounds arranged in a monomer form, the organometallic compounds being suitable for filling an already existing pattern of the at least one patternable polymer resist layer and for breaking up and repatterning the already existing pattern, wherein an optical property of the optoelectronic component is ~~configured to be selectively changed~~ changeable as a function of a type of the monomeric organometallic compounds and as a function of a temperature and an application time, the filling of the unexposed regions of the at least one patternable resist layer occurring, through one of the gas-phase diffusion and the liquid-phase diffusion and with an application of heat, from a surface of the unexposed regions through the etching mask, and occurring from the side surfaces uncovered by the deep etching,

so that at least one of the active and the passive polymer-based components for use in integrated optics is fabricated.

8. (Previously Presented) The process according to claim 7, wherein the at least one patternable polymer resist layer includes novolak.

9. (Previously Presented) The process according to claim 7, wherein the organometallic compounds include heavy metal-containing compounds.

10. (Previously Presented) The process according to claim 7, further comprising the step of:  
selectively controlling a swelling occurring during the one of the gas-phase diffusion and the liquid-phase diffusion in the at least one patternable polymer resist layer by varying a time for the one of the gas-phase diffusion and the liquid-phase diffusion and varying the temperature until a compensation for pattern inaccuracies occurs.

11. (Previously Presented) The process according to claim 7, further comprising the step of:  
using one a vacuum and air at a standard pressure in interstices of the at least one patterned polymer resist layer in order to adjust a difference in refractive indices of  $> 1.5$  with respect to patterns in the filled at least one patternable polymer resist layer.

12. (Previously Presented) The process according to claim 7, wherein:  
the at least one patternable polymer resist layer includes a polymer pattern filled with the monomeric organometallic compounds,  
the polymer pattern filled with the monomeric organometallic compounds is surrounded by electrical electrodes, and  
optical properties of the polymer pattern filled with the monomeric organometallic compounds are influenced by controlling an electrical field applied between the electrical electrodes.

13. (Previously Presented) The process according to claim 7, wherein:  
the at least one patternable polymer resist layer includes a polymer pattern filled with the monomeric organometallic compounds,  
the polymer pattern filled with the monomeric organometallic compounds is connected to waveguides,  
light is injected through the waveguides and into the polymer pattern filled with the monomeric organometallic compounds, and  
optical properties of the polymer pattern filled with the monomeric organometallic compounds are influenced by varying the injected light.

14. (Previously Presented) The process according to claim 7, wherein:  
the etching mask is produced by performing the steps of:  
exposing defined regions of the at least one patternable polymer resist layer corresponding to the later component,  
performing a silylation of the unexposed regions of the at least one patternable polymer resist layer, and  
after performing the silylation, smoothing edges of the etching mask by an isotropic etching attack using an agent which attacks the silicon oxide of the etching mask.